

Attorney Docket: P-15149  
Serial No.: 09/431,159  
Filed: November 1, 1999

In the Claims:

Please amend claim 1 as follows.

1. (Currently amended) Apparatus of processing heavy hydrocarbon feed comprising:
  - a) a heater for heating said heavy hydrocarbon feed;
  - b) an atmospheric fractionating tower for fractionating the heated heavy hydrocarbon feed fed to the inlet of the atmospheric fractionating tower producing light atmospheric fractions and atmospheric bottoms;
  - c) a further heater for heating said atmospheric bottoms and producing heated atmospheric bottoms;
  - d) a vacuum fractionating tower for fractionating said heated atmospheric bottoms and producing light vacuum fractions and vacuum residue;
  - e) a solvent deasphalting (SDA) unit for producing deasphalted oil (DAO) and asphaltenes from said vacuum residue;
  - f) a deasphalted oil thermal cracker for thermally cracking said deasphalted oil (DAO) and producing thermally cracked deasphalted oil, a thermally cracked deasphalted oil connector connecting an outlet of said deasphalted oil thermal cracker to an inlet of said first fractionating tower, said first fractionating tower being said atmospheric fractionating tower, by way of a line

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so that only said thermally cracked deasphalting oil is recycled to the inlet of said atmospheric fractionating tower by way of said line; and

g) a light vacuum fraction thermal cracker for thermally cracking said light vacuum fractions for producing thermally cracked light vacuum fractions, a thermally cracked light vacuum fractions connector connecting an outlet of said light vacuum fraction thermal cracker to an inlet of said first fractionating tower by, said first fractinating tower being said atmospheric fractionating tower, by way of a line so that only said thermally cracked light vacuum fractions is recycled to the inlet of said atmospheric fractionating tower by way of said line.

2. (Canceled)
3. (Canceled)
4. (Canceled)
5. (Canceled)
6. (Canceled)
7. (Canceled)
8. (Canceled)
9. (Canceled)
10. (Canceled)

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11. (Previously presented) Apparatus according to claim 1 including means for supplying only the heavy portion of said light vacuum fractions to said further thermal cracker.

12. (Previously presented) Apparatus according to claim 2 including a hydrogen donor system for processing a portion of said light atmospheric fractions produced by said atmospheric fractionating tower and producing a hydrogen donor stream, said hydrogen donor system including:

- a) a hydrotreater for producing a treated hydrocarbon feed from said portion of said light atmospheric fractions produced by said atmospheric fractionating tower;
- b) a still further heater for producing a heated, treated hydrocarbon stream;
- c) a further atmospheric fractionating tower for fractionating said heated, treated hydrocarbon stream for producing further light atmospheric fractions and further atmospheric bottoms;
- d) an additional heater for heating said further atmospheric bottoms and producing heated further atmospheric bottoms; and

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e) a further vacuum fractionating tower for fractionating said heated further atmospheric bottoms and producing further lighter vacuum fractions and further vacuum residue wherein a portion of the heavier portion of said further lighter vacuum fractions or hydrogen donor stream is supplied to said deasphalting oil thermal cracker and a further portion of the heavier portion of said further lighter vacuum fractions or hydrogen donor stream is supplied to said light vacuum fraction thermal cracker.